

Making Music You Can See

Integral Connection Between Sound and Colour

By A. Efimiev

A Soviet scientist takes the first step in combining sound and colour and creating colour music that you cannot only hear but also see.

Scientists have since ancient times noted the integral connection between sound and colour. Aristotle had already noted that the auditory and visual sensations accompany and reinforce each other. Musicians have long dreamed of combining music with colour, but it had till recently remained a dream only.

The Russian composer Skryabin was the first to write a special colour movement for his symphonic poem *Prometheus* which he left unfinished when he died, but to this day the sign he used in the part marked "Light" have not been deciphered. Skryabin did not succeed mainly because of the inadequacy of the technical means at his disposal

Now, many years later, Skryabin's dream is beginning to be realized, thanks to a young scientist, Konstantin Leontyev, who has already succeeded in transforming musical sounds into colour patterns.

Leontyev first got his idea of the close connection between light and sound when he noticed on a train journey that the tapping sound of the wheels seemed to grow louder and softer as the sunlight appeared and disappeared.

First Experiments

After intensive research the young student, as he was then, put on a colour show at the New Year Party of his institute at the beginning of 1952.

By a system of audio-frequency filters controlling a battery of coloured lights, he accompanied a recording of Paul Robeson's rendering of "*Mighty Like a Race*."

Great as was the ovation he received, Konstantin Leontyev's head was not turned.

He realised that this was only an experiment, the beginning of bigger achievements to come. He had chosen the combination of colours and sounds to suit his own taste. The experiment was not scientifically grounded.

What were the laws governing the impact of sound and colour upon the sense? It took many years of persistent work to find the key to the solution of this problem.

Leontyev started with the assumption that the sense organs are channels of communication which provide man to contact with the outer world.

Each channel is distinguished by the amount of information which can pass through it in a given time. The more developed the sense organ, the more sensitively does it react to the external medium, and the more information is passed through it.

Soviet and American physiologists have shown that the most perfect of the senses is sight. Its "carrying capacity", for example, is many times that of hearing. Therefore it should be possible to convey all sound information, without loss, in the form of colour signals.

Leontyev spent several years making an extensive study of the laws governing human reaction to all aspects of sound and sight. He was able to do this only with the aid of cybernetics and various electronic devices.

Basing himself on the established inter-connections between hearing and sight in the lower centres of the brain, Leontyev developed a method and an electronic device for turning sound into colour.

The more he worked on the problem, the clearer it became to him that the new colour music, for the sake of which he had begun his research, was only one small part of the application of the connections between hearing and sight he had discovered.

Physiology, telemechanics, automatic control of production are the fields in which, according to experts of the Inventions Committee of the Soviet Government, young Konstantin Leontyev's researches can find wide application. He was given a special laboratory in which to continue his work.

But what about this new aspect of music you can see? Leontyev has no intention of dropping this fascinating side of his work.

Electronic Device Transforming Sound into Colour

Now, with the aid of a device invented by him, the sounds of ordinary music are turned

into electric signals, analysed, and transferred to a logic mechanism, where the main features of music—its effect on the primary signal system of man—are brought out.

Subsequently, the "information tension" relating to each feature is conveyed to a mechanism controlling the quality, duration and brightness of colour. It is conveyed in such a way as to make the impact of colour correspondent both qualitatively to the impact of music.

The device can operate also in reverse and then colour "drowns out" the impact of music.

As a result of Leontyev's discoveries it is possible to make it easier or harder to hear sounds and music. In turn, a finer reaction to music leads to a deeper understanding of moving colour.

When I asked Leontyev what he has gained by his researches in the field of art, he says very modestly: "I have taken the first step towards making colour music."